OSAT Newsletter

Glenn Research Center

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Office of Safety and Assurance Technologies

INSIDE THIS ISSUE

Jim Swavely Silver Snoopy Award

Jim Swavely recently received the Silver Snoopy award for his contributions to the International Space Station program. Although many of us know GRC supports the International Space Station, few are aware that the Office of Safety and Assurance Technologies has a Resident Office in California with two employees providing ongoing evaluation of the Safety & Mission Assurance and Systems Engineering and Integration processes.

Jim is a member of this on-site Headquarters' Independent Assessment Team where he identifies programmatic risks and technical issues, makes recommendations for their resolution, and provides senior NASA management with non-advocacy assessments of program health and status.

Jim has an extensive background in equipment design, manufacturing, and testing– primarily for manned spaceflight hardware. This ability has allowed him to contribute numerous improvements to the ISS's Electrical Power System and its related hardware components. These contributions will significantly increase reliability and performance. He has made contributions to almost every Orbital Replacement Unit (ORU) designed by Boeing-Conoga Park, and has been a key player in developing and proposing beneficial process improvements.

Jim's job requires that he maintains close relations with the engineers involved in addressing design issues, and is normally offered pre-release copies of worst-case analyses, and other analytical documentation for informal review and concurrence. He regularly participates in engineering change activities including participation and input into Engineering Review, and Failure Review Boards. As work and testing ramp-up on the International Space Station and Failure Review Board activities increase, Jim has increasingly been consulted by the Defense Contract Management Command's quality engineers prior to their approval of test plans. As a member of the Engineering Review Team, Jim actively participates in Critical Design Reviews (CDR) and Functional Configuration Audit activities.

All of these activities have had a significant impact in the successful attainment of the development and

The Integration of Probabilistic Tools into the Aeronautics Risk Management Program at NASA Glenn Research Center

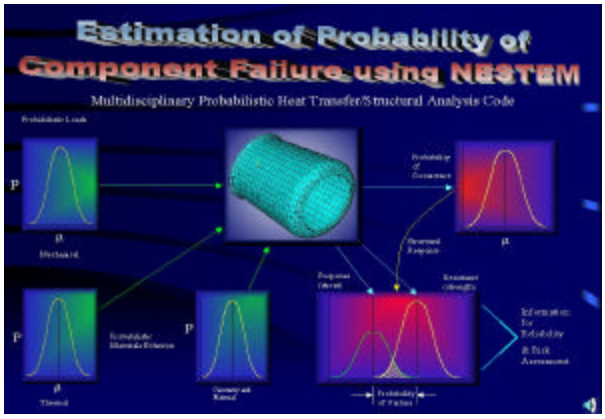
NASA Glenn Research Center is looking to the future in implementing the NASA continuous risk management initiative. Currently, qualitative aeropropulsion risk assessments are being performed within the aeronautics programs at the Center. One future emphasis will be on quantitative system risk assessments, which are to be developed using the probabilistic Quantitative Risk Assessment System (QRAS). Some of the input for the system assessments will be provided via a Probabilistic Structural Analysis (PSA) methodology, which was developed originally at Glenn Research Center for the Space Shuttle Main Engines, and significantly enhanced during the High Speed Research Program. The plan is to apply the new probabilistic quantitative methodology to the revolutionary engine system concepts envisioned for the future.

Probabilistic methods have the potential to greatly increase aviation/aerospace safety, if they are included as part of the overall program, and especially within the design, risk assessment, and life prediction processes for rotors, blades, and other engine components. Significant weight savings, a shortened design cycle, reduced testing requirements, and a greater understanding of system safety can be realized from implementing these methods. Considering the large benefits, quantitative probabilistic risk assessment will be applied to aeropropulsion programs at Glenn, and the methodology will be transferred to industry as appropriate.

The QRAS project was started on July 29, 1996, by the NASA Administrator when he directed the Associate Administrator of the Office of Safety and Mission Assurance, and the Space Shuttle Program Manager to begin the project. The project produced QRAS in the form of a personal computer-based software tool. In addition, a space shuttle system model was produced that can be used to calculate the change in the probability of failure of the space shuttle at the top level, as well as at the intermediate subsystem levels, for proposed upgrades. The probabilistic models of the subsystem failure modes are based on the latest available data from a variety of sources, such as test, analysis, experience, problem reporting, and other databases. An event-sequence diagram is used within QRAS to logically describe the manner in which subsystem failure modes can lead to Mission Success (MS), or Loss of Mission (LOM), including the mitigation events, such as inspections. A benchmark model of an aeropropulsion engine is being developed to support advanced concept system studies this year. Being done by Michael H. Packard and Dr. Shantaram S. Pai,

The Probabilistic Structural Analysis (PSA) was developed to analyze Shuttle Main Engine components using Numerical Evaluation of Stochastic Structures Under Stress (NESSUS). The development continued under the High Speed Research Program to include the Numerical Evaluation of Stochastic Thermal Environment Models (NESTEM) in the analysis. Advanced components such as a CMC combustor design and high temperature turbomachinery blades were analyzed in support of the High Speed Research Program. Future advanced aeropropulsion components are to be evaluated using the PSA methodology, in support of the Glenn Ultra Efficient Engine Technology Program. The probabilistic results from the component evaluations will be utilized as input for QRAS in the probabilistic system simulation.

Partnerships with the Wright Patterson Air Force Base (WPAFB), FAA, Navy, and industry have been established to collaborate on these new probabilistic methods. One example is a working group that is addressing rotor/disk failures in commercial air carriers, which have resulted in a significant number of catastrophic aviation accidents. The results from this working group will be published in the near future as an aircraft circular that addresses rotor/disk design using probabilistic methods. A number of new initiatives are planned for the future.



Quality Assurance Special Achievement Recognition (QASAR)
"Best of the Best" Award Given by the Administrator

Each year the “Best of the Best” of that year’s local QASAR Award recipients are selected for Agency recognition. Each Center and Headquarters may submit one nomination in each category for consideration in the “Best of the Best”. The Center Director must sign nominations from the Centers, and the nominating Associate Administrator must sign nominations from the Strategic Enterprises and Headquarters Functional/Staff Offices. The QASAR Award Board will select one recipient in each category.

The QASAR “Best of the Best” Award plaques will be presented by the Administrator at the Annual NASA Continual Improvement and Reinvention conference, usually held in late winter or early spring.

QASAR AWARD BOARD

The Deputy Associated Administrator for Safety and Mission Assurance chairs the QASAR Award Board. It consists of representatives from Headquarters and each Center; It convenes annually to select the QASAR Award “Best of the Best” recipients.

The 1999 GRC nomination is on the Center Director's desk for signature. These four persons will be eligible for a potential $10,000 award.

Here are the results for 1998 "Best of the Best" Award held in April 1999.

QASAR CEREMONY

In 1998 the Centers' and Headquarters' Offices submitted 29 nominations for the QASAR Board to consider. The name of the award was changed to “Quality and Safety Achievement Recognition to underscore NASA's goal to the Nation's premier safety spearhead.

On February 24, 1999, the QASAR Award Board (Consisting of NASA’s Safety and Mission Assurance Directors), chaired by Michael Greenfield, met and selected the 1999 “Best of the Best” QASAR Award winners. A winner was selected in each category.

“Alan Phillips”

“Receives the award in category 1- Most Significant Safety and Mission Assurance Contribution from within a NASA SMA Organization.

The Plaque Reads

Alan H. Phillips
Office of Safety and Facility Assurance
NASA—Langley Research Center
For
Extraordinary leadership and outstanding performance in making Langley Research Center the first Federal site to participate in and be certified by OSHA's voluntary protection program

Langley became the first Federal work site to participate in OSHA’s Voluntary Protection Program (VPP) at the Star Level. Star Certification is the highest level of recognition in the VPP. Mr. Phillip's efforts allowed Langley to join an exclusive group of approximately 465 private organizations recognized since 1982 for having outstanding safety and health programs.

Emergency Response at Glenn Research Center

During this past year, the Glenn Safety Office (GSO) staff has effectively responded to a variety of emergencies. I would like to take this opportunity to address the process that currently exists at the Center when an event occurs that we classified as an emergency.

In general terms, any unplanned and/or uncontrolled event that adversely affects personnel and/or property will be referred to as an emergency until it is brought under control, either by GRC personnel or local community response. When a mishap occurs creating an emergency situation, the person or persons observing the event should call for help using the in-house telephone and dialing 911. The Center Emergency Dispatcher, located in Building 14, will answer the call. If the call relates to an employee being ill or injured, the dispatcher will call immediately for local support to the community that has jurisdiction for the response. DO NOT HANG UP THE TELEPHONE. The dispatcher may need further information about the victim(s). At the same time, the dispatcher will alert the Emergency Response personnel (assigned to GSO) to respond and to provide immediate medical care until the local response arrives and the victim(s) is transported to a local medical facility. The Emergency Response Personnel are trained, certified Emergency Medical Technicians (EMTs). Our EMTs are equipped to provide emergency medical care including the use of a defibrillator.

If an individual is transported to an outside facility for medical care, it is the responsibility of the supervisor to notify the next of kin of the whereabouts of the individual. The supervisor should not discuss the condition of the individual to the next of kin. This is the responsibility of the medical provider at the facility where he/she was taken for further care. The emergency notification information of every civil service employee is contained in his or her personnel folder. Filling out a NASA C-405a "Employee Personnel Information Notice" provides this notification information. Please ensure your records are up to date, because you never know when you are going to need this information. If the supervisor needs assistance in contacting the next of kin, they should contact the Office of Human Resources.

If the emergency involves more than a medical response the Center dispatcher will alert the Emergency Coordinator and Emergency Response Team EC&ERT to respond and to assess the situation. The Emergency Coordinator becomes the liaison between the local community response and the Center's Emergency Response Team (ERT). The ERT is composed of Glenn employees from various organizations who have actions and responsibilities in the event of specific emergencies at the Center. These organizations include the Glenn Safety Office, the Environmental Management Office, the Security Management Office, the External Programs Directorate, and Facilities and Technical Engineering Division and Eternal Programs. This Team makes decisions based on the information provided by the response element with Eternal Programs coordinating all communication with the media. The Team will approve all remediation actions. Even though the ERT is not activated for every emergency, the Team Leader, the Emergency Coordinator, is informed of every event and he decides whether to activate the ERT or not.

If an event does occur, the supervisor is responsible for documenting the incident for the Glenn Safety Office within 24 hours. Documentation can be accomplished electronically by submitting a "NASA Initial Mishap Notification Report" (1627A Form). A "NASA Mishap Report" 1627 Form, including corrective actions, is still required to be completed after an investigation and within 10 working days of event occurrence. In some instances an Accident Investigation Team is appointed to evaluate the event, determine probable cause, and provide recommendations to prevent recurrence. The report generated by this Team will be part of the final Mishap Report.

I hope that this helps everyone in understanding the elements of the Emergency Response process. If you have any further questions or comments related to this process, please call Mr. Manuel Dominguez, Glenn Safety Office at 3-6735.

Environmental Management System Project

GRC One of Three NASA Test-bed Centers

NASA is committed to conducting operations while protecting the environment for future generations. NASA's Environmental Strategic Plan, *Environmental Excellence for the Twenty-First Century* (http://www-jj.ksc.nasa.gov/jj-d/nasaplan/intro.htm), is a framework for meeting today's environmental challenges based on the vision that we will continue as a world leader in space exploration and aeronautics while maintaining environmental excellence.

Environmental excellence doesn't "just happen." It takes sound management, professional expertise, and the support of the entire organization. When these pieces come together they create an environmental program that is efficient and effective in minimizing today's impacts, reducing future liability, and ensuring a world that we are proud to pass to future generations.

Effective environmental management is the keystone of environmental excellence and is receiving increasing attention. By the time you read this, President Clinton should have signed the Executive Order, *Greening the Government Through Leadership in Environmental Management*. This Executive Order requires all federal agencies to implement Environmental Management Systems (EMS) based upon the U.S. Environmental Protection Agency's *Code of Environmental Management Principles* (CEMP). The EO also emphasizes pollution prevention (including the life-cycle assessments and environmental cost accounting), reductions in the use and release of toxic chemicals and priority pollutants, reductions in ozone-depleting substances, and environmentally and economically beneficial landscaping.

What is CEMP? CEMP is basically an extension of the ISO 14000 Environmental Management Standard with additional requirements for ensuring compliance with environmental regulations. ISO 14000 is an ISO 9000-like management standard focused specifically on environmental management. Like ISO 9000, ISO 14000 registration is becoming a necessary certification in international business circles.

In anticipation of this Executive Order, NASA Headquarters and NASA Centers environmental personnel have reviewed our Agency's existing EMS to determine how it stacks up against the ISO/CEMP requirements. A gap analysis was performed and a benchmarking study was done on the ISO 14001 environmental management systems at Ford, IBM, and the Department of Energy. These studies were evaluated and rolled into a formal program to develop and test the implementation of a new NASA-wide Environmental Management System.

The new EMS is being developed by a NASA "EMS Core Team" of environmental professionals from NASA Headquarters, NASA Centers, and ICF Consulting with oversight by the NASA Environmental Management Board. A working draft of a NASA EMS Procedures Manual is nearing completion and will be implemented on a test basis at three NASA Test-bed Centers: Johnson Space Center, Stennis Space Center, and Glenn Research Center. NASA has a significant investment in existing EMS at the Centers and we are proud of our programs.

Environmental excellence doesn't "just happen." It takes sound management, professional expertise, and the support of the entire organization.

The intent of the new EMS is to improve, not replace, existing management systems. The EMS is designed to be flexible so that each Center can take advantage of their existing management systems, including recent investments in ISO 9000 processes and procedures. At GRC the new EMS will be integrated into the Center's ISO 9000 Business Management System.

Probably the biggest impact is the need to develop a formal process for identifying and prioritizing environmental impacts with involvement of management, researchers, and facilities personnel. The process will identify impacts that must be managed and require the establishment of goals, objectives, and performance measures for priority impacts.

Implementation planning at Glenn will begin in February, and will require active involvement by stakeholders and customers. The year-long test implementation is scheduled to begin in April, and will include extensive tracking of both direct and indirect costs including opportunity costs, for comparison against benefits of the improved EMS. The results of implementation at the three Test-bed Centers will be evaluated and the results presented to NASA's Capital Investment Council in mid-2001. For additional information on this project please contact Mr. Michael Blotzer, Chief, of the Environmental Management Office, at 433-8159.

EMPLOYEE REBADGING

The Security Management Office is in the process of rebadging all Center personnel via a new badging system. All non-government personnel will be rebadged first by company, and then the government personnel will be badged by organization code. The Main Gate Badge Clerk will schedule personnel according to their respective workareas. We ask that all personnel make an effort to comply with the time allotted to them so this process can run as smoothly as possible. Your cooperation in this effort will be greatly appreciated.

OFFICIAL VISITORS

Employees are reminded that the expeditious processing of your visitors is largely your responsibility. Please make every effort to contact your respective Visitor Control Clerk at least 24 hours prior to your visitor's arrival. Advance notification gives the Visitor Control Clerk time to prepare the badge and have it available when your visitor arrives. The Visitor Control Clerks are located at the following sites:

Main Gate – 3-2205
DEB Lobby – 3-2328
Administration Bldg. Lobby – 3-2919

SUPPORT SERVICE CONTRACTORS

We would like to remind all on-site support service contractors and their COTR's of the provisions of the security clause portion of your contract and the importance of its compliance. The security clause reads as follows:

All contractor personnel having a need to enter areas of the Glenn Research Center or Plum Brook Station shall have an identification badge or pass. This badge or pass shall be obtained at the entrance of the Glenn Research Center or Plum Brook Station. In addition to the requirements contained herein, the Contractor shall comply with GRC Management instruction LMI 1900.3, Managing Conduct Issues Affecting the Center.

Resident Contractors (Picture badged employees)

1. The on-site company supervisor will notify the Main Gate Badge Clerk at 3-2206, when a new employee is reporting to work. The Badge Clerk will give the company supervisor specific instructions as to how the new employee will be badged, photographed, fingerprinted, etc.

2. When an employee terminates and/or resigns employment, the company supervisor will issue to the employee NASA Form C-10087, Non-NASA Separation Clearance Record. The company supervisor or his designee will be responsible for making an inquiry of all offices listed on the form to see if the employee has any outstanding Government items. The employee will then take this form to all offices that list he/she has outstanding items. The employees last stop is the return of their Government-issued I.D. Badge.

3. Company supervisors are to ensure that the terminated and/or resigned employee has returned his/her badge to the Main Gate Badge Clerk. Final Clearance of a Contractor upon completion of the contract will depend in part upon accounting of all badges issued to employees during the performance of the contract. It should be recognized that security badges are Government property and any alteration or misuse of these badges may be prosecuted as a violation of Section 499, Title 18, U.S. Code.

Please note that employees of the Credit Union, Cafeteria/Exchange, and Lewis Little Folks are also to comply with the above procedures.

The NASA Technical Standards Program

Why NASA Needs to Develop/Adopt Prescriptive Standards
Given the Emphasis on Performance-Based Procurements

Frank J. Greco, GRC, and Paul S. Gill, MSFC,
NASA Engineering Standards Steering Committee

The NASA Technical Standards Program was begun in response to the relatively recent government emphasis on increasing the use of "private-sector" standards, awarding performance-based contracts, and supporting Single Process Initiative/Block Changes. Its purpose is to develop, adopt, and publish a NASA-wide list of prescriptive (voluntary or government-unique) standards to aid NASA in implementing this new direction, as NASA will continue its need for unique or specialized prescriptive standards for the following reasons:

(1) It's likely that not all NASA contracts will be performance based, or use Single Process Initiative/Block Change-type approaches.

(2) NASA Preferred Technical Standards will continue to be useful on "In-house" projects and to provide commonality among Centers.

(3) NASA will always impose some standards and specifications, such as those for safety and other NASA-unique needs.

(4) NASA Preferred Technical Standards provide guidance and reference to NASA personnel in requesting and evaluating proposals, i.e., making them better-informed buyers.

(5) The listing of NASA Preferred Technical Standards provides a mechanism to share experiences (lessons learned) gained from years of NASA's unique activities.

(6) The products of the NASA Technical Standards Program reflects NASA compliance with the intent of OMB Circular A-119 (reference Public Law 104-113) and NASA Policy Directive NPD 8070.6A.

(7) NASA Preferred Technical Standards enable interoperability for NASA and its contractors, thus allowing "cheaper, faster, better" initiatives to proceed more efficiently.

(8) The existence of NASA Preferred Technical Standards are useful in developing NASA-unique project interface control documents.

OMB Circular A-119, *Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities*, directs NASA to "use voluntary consensus standards in lieu of government-unique standards except where inconsistent with law or otherwise impractical." It also states that NASA should "give preference to performance standards when such standards may reasonably be used in lieu of prescriptive (Voluntary Consensus or Government-unique) standards."

This requirement may appear on its surface to direct NASA stop or curtail the development, use, or adoption of such prescriptive standards, as these prescriptive standards cannot be mandated in performance-based contracting. This view "misreads" the purpose of the A-119 program (and NASA's initiative for "better, faster, and cheaper" missions). At its base, Circular A-119 seeks to reduce the redundancy and conflict among Government, Industry, and Consensus (Industry-wide) standards, not to prevent NASA from identifying standards that meet its often-unique requirements or developing its own standards, when necessary.

The goal of the NASA Technical Standards Program is to better enable NASA to become more productive through the use of NASA-endorsed (adopted) non-government technical standards, help it deal more effectively and efficiently with its suppliers, and assure its compliance with A-119 within the context of NASA's unique needs. The Program also aims to assist NASA engineers and project managers in selecting appropriate standards for their programs and in assessing proposals.

Performance-based standards and specifications are integral to achieving these goals. When, however, an appropriate safety, mission success, business or technical justification can be made for mandating prescriptive standards or specifications, NASA should not be deterred from assuring its program success by doing so. The existence of a readily-available NASA core list of *adopted* Standards will allow such evaluations of "appropriateness" to be done in a more timely manner and with more confidence.

The terminology used when talking standards is sometimes confusing and, in some cases here, quite new

and not in common usage. A few key definitions may be helpful:

(1) ***Performance Standards*** state requirements in terms of delivered results with criteria for verifying compliance, but without stating the methods for achieving the required results.

(2) ***Prescriptive Standards*** specify design requirements and methods, such as material composition, how a requirement is to be achieved, or how an item is to be fabricated or constructed. (Prescriptive standards may be Government-unique, or Non-government, such as Voluntary Consensus or Industry Standards.)

(3) ***Government-unique Standards*** are those developed by the government (NASA, DOD, etc.) for its own or its contractor's use.

(4) ***Non-government Standards*** are standards developed by a private-sector enterprise, association, organization or technical society for its own, discipline, industry-segment or wider use.

(5) ***Voluntary Consensus Standards*** are those Non-government standards that are published by domestic and international Voluntary Consensus Standards bodies (ISO, ANSI, ASQC, etc.), for the use of all who may apply them. Other Non-government standards include ***Non-consensus Standards***, i.e., industry standards, company standards, or "de facto" standards developed in the private-sector but not with a full *consensus* adoption process.

(6) ***"Use"*** in A-119 means the incorporation of a standard in whole, in part, or by reference **for** procurement purposes, or the inclusion of a standard in a regulation. (The focus for NASA, of Circular A-119 is standards **used** for **procurement purposes**, not for in-house or other purposes.)

(7) ***"Impractical"***, as applied in A-119, may include circumstances in which the ***use*** (of any standard) would fail to serve NASA's program needs, including safety; or be unfeasible, inadequate, ineffectual, inefficient, inconsistent with the mission; or impose more burdens, be less useful, or less cost-effective than the application of another standard. (This becomes a key point relative to NASA applying standards in procurements, especially when requesting or evaluating proposals.)

Efforts to convert NASA or other Government-unique standards and specifications to Voluntary Consensus Standards are also underway. The desire to expedite conversion of Government standards to Voluntary Consensus Standards should not, however, replace use of informed technical and business decision processes. Rather, they should reflect technical experience-based analysis of impact, as well as sound business practices.

As appropriate, one may use NASA or other Government Standards, Non-government Standards, in-house requirement documents, contractor standards, or write specifications directly into a contract. Invariably, there will often be the need (i.e., safety, project-unique requirements, test methods, integration, compatibility with existing systems, etc.) for certain unique standards to be applied by NASA for procurement purposes.

When, however, NASA uses a Government-unique Standard in lieu of an existing Voluntary Consensus Standard, A-119 also requires that a detailed justification must be provided for the record.

Another significant reason NASA needs to continue to develop/adopt standards is to provide a commonality among the NASA Centers, both for use on in-house projects and when specifying procurements. This will ensure better interoperability, interchangeability, integration and repeatability.

The need remains, therefor, for NASA to adopt or develop some prescriptive standards products even though the use of performance standards is preferred for performance-based contracts.

In order to meet these needs, NASA must develop/adopt a coordinated and consistent core listing of "preferred" technical standards, either through standards development by in-house talents or the adoption, where practical, of existing or sponsored Voluntary Consensus Standards.

NASA employees' involvement in the development of Non-government standards, especially for Voluntary Consensus Standards, serves NASA and its mission in several important ways. These include:

(a) NASA needs to be an informed customer in order to properly evaluate contractor proposals and effectively participate on Integrated Product Teams.

(b) NASA needs to identify its needs to its contractor base, to promote generic alternatives, and to contribute towards solutions of generic problems.

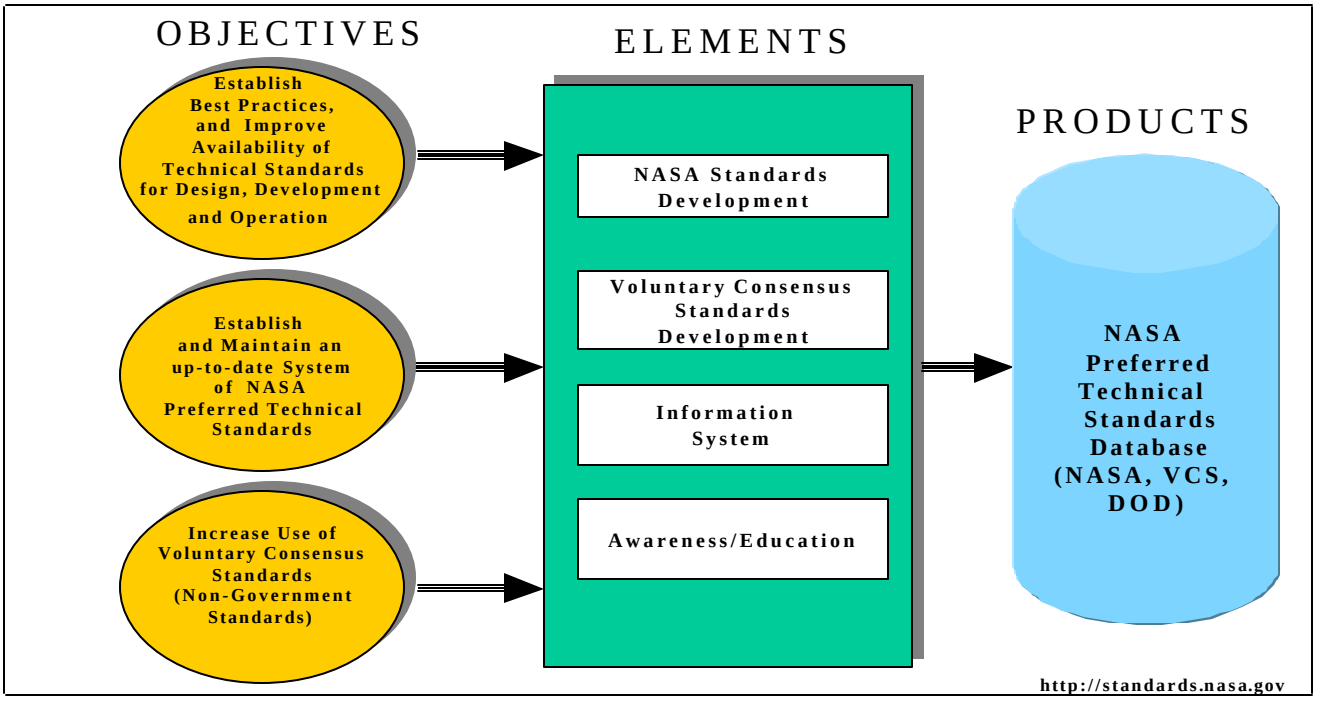
(c) NASA personnel have a wealth of knowledge and experience, and can provide insight into standardization processes known to work or not work under given conditions.

(d) Standards products can be valuable tools when they are applied as *guidance* documents (standards, specifications, handbooks, guidelines, and recommended practices), rather than as *mandatory* standards. The insights gained by NASA employees participating in the development of Non-government Standards adds important value in this respect.

As noted, NASA continues to need an accessible base of "NASA-preferred" Government-unique and Voluntary Consensus Standards, which can be used throughout NASA to provide guidance and for reference in the evaluation of proposals. These *preferred* standards reflect the results of lessons learned from much hard won experience.

NASA also needs to become more involved with the standards development bodies to fully comply with Public Law 104-113, as reflected in Circular A-119. Among other things, this policy requires: 1) participation in (and support of) Voluntary Consensus Standards bodies; 2) development of NASA standards (or use of another government-unique standards) only when no Voluntary Consensus Standard exist for practical NASA use; and 3) reducing costs, increasing access to commercial products and processes, and the timely use of current technology. *Performance* Standards should be used unless the purpose of the procurement can be better achieved by use of Government-unique (NASA, MIL-SPEC, etc.) or Non-government *prescriptive* standards or specifications, such as Voluntary Consensus Standards.

In summary, NASA continues its need to develop and adopt prescriptive standards, even though there is current emphasis on performance-based contracts with only final product-performance standards applied. When NASA goes where NASA goes, it must get there safely, on time, and at cost; and sometimes the only way to assure that is to apply a standard as unique as the mission.



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(1) ***National Technology Transfer and Advancement Act of 1995***, Section 12(d) of Public Law 104-113, 1995.

(2) ***NASA Policy Directive-Technical Standards***, NPD 8070 6A, October 10, 1997.

(3) ***Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities***, OMB Circular A-119 (Revised), Pending Formal Approval, October 1997.

(4) ***The Standardization Newsletter***, Acquisition Practices Directorate, Deputy Under Secretary of Defense for Industrial Affairs and Installations (IA & I), December 1997.

(5) ***NASA Engineering Standards Steering Committee, Notes*** from December 4,1997 Meeting.

Environmental Outreach Program

The Environmental Outreach Program, in partnership with the Aeronautics Directorate, had a very busy, successful, and exciting year in 1999. The Aero-Environmental Exhibit Bus traveled to 21 different events, which included three air shows and as far away as Decatur, Illinois, for a four day celebration. Over 35,000 people boarded the bus this year and saw the highlights of the types of facilities and research performed at The Glenn Research Center.

The Aeronautics Environmental Impact Traveling Exhibit is contained within a 40-foot long bus and is a mobile educational vehicle for "spreading the word" about the work being done at NASA Glenn Research Center in the area of environmental protection aspects of our Aeronautics programs and other research programs.

Exhibits and videos inside the bus, viewed by standing or sitting in comfortable seating, tell the story about the relevance of aeronautical work and other research done at GRC. The Exhibit is geared toward the adult visitors, however many children have had great experiences with the exhibit also.

GOALS:

- Use the Exhibit at fairs, libraries, local events within Ohio and surrounding State's to inform and educate adults about the Center's vital role in environmental care taking through its aeronautical work. While also highlighting the Center's work in advances in Aerospace, space, and basic research.
- Achieve increased local/state government interest and awareness of Glenn's programs.
- Achieve increased grassroots interest in Glenn programs by highlighting the current benefits of GRC technological contributions and future possibilities.
- Increase overall public awareness of Glenn's research, investments, and achievements for a better future and a better life for them.

Dan White, Aeronautics Environmental Impact Traveling Exhibit project lead and the Environmental Management Office Resource and Outreach team leader, say's "A Commercial Drivers License is required to drive the bus. This year we trained 6 drivers. Five of the 7 trained drivers are civil servants. The bus has been very successful in telling the public that we are here and a little about what we do at GRC." "It has been quite an experience meeting all the people and we usually get a very positive reaction when they board the bus and watch the video." The secondary benefit is the thousands of on-lookers we get just driving the bus down the road. " That's Priceless."

Listed below are the qualified drivers and some of the many volunteers that assisted with the bus.

Drivers: Howard Gregory, Mark Hyatt, David Justavick, Peter Kennedy, Michael Lupton, Frank DeAngelo, and Daniel White.

Volunteers: Eli Abumeri, Devan Anderson, David Antczak, Theresa Babrauchas, James Bodis, Christine Block, John Butauski, Robert Cole, William Darby, Eugene DeSanto, Ransook Evanina, Arthur Gedeon, Pat Gedeon, Steve Guzik, Avis Hudson, Mark Hyatt, Sandra Jacobson, Dave Justavick, Richard Kalynchuk, Peter Kennedy, Walter Kocher, Kathrine Martin, Toni Mayor, Daniel Papcke, Joan Pettigrew, Ruben Ramos, Kenneth Street, Jeffery Wagner, and Ingrid Wagner

If you are interested in getting involved in the outreach program contact Dan White at 3-3103.

Visit the web site at (http://www-osma.lerc.nasa.gov/oep/GRC_Bus/schedule.htm)